

## Two New Finds and Two New Age-Determinations of Mammoths from Norway

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Two new mammoth finds are described – a minute fragment of pelvis from Kvam in Gudbrandsdalen (1970), and a fragment of mammoth tusk from near Vågåvatnet (1973). Two previously collected mammoth samples were age-determined by two different methods and yielded the following results: a tusk from Fåvang –  $22,370 \pm 980$  and  $20,000 \pm 250$  before our time – and a fragment of scapula from Lillehammer –  $46,000 \pm 2,000$  and  $45,000 \pm 1,500$ .

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In 1970 a strongly rolled fragment of bone was found in a gravel pit near Kvam railway station in Gudbrandsdalen. Previously, two fragments of mammoth tusk and also an almost complete ulna of juvenile mammoth were found in this same pit (Heintz 1956, 1969).

The bone is elongated and triangular in shape and is about 29 cm in length and 13 cm across its broadest part. It is undoubtedly a fragment of large bone, but difficult to determine which part of the skeleton it belongs to. Dr. Lepiksaar in Gothenburg, Sweden, examined it and came to the conclusion that the bone is most probably a strongly worn, defect fragment of *ramus acetabularis* from the right *os ischium* of a mammoth.

Up to the present time, the gravel pit near Kvam is the richest Norwegian mammoth locality. Four fragments of mammoth bone have already been found there.

The second find with which we are concerned here was made in the summer of 1973 in a typical moraine gravel pit west of the river Tessa's outlet into the lake Vågåvatnet. It was a fragment of mammoth tusk about 21 cm long and 7–8 cm in diameter at its broadest part. From the curvature of the piece, however, it can be calculated that the tusk must have been about 10 cm in diameter, and so is a fragment of the second largest tusk known from Norway. The largest was the second tusk find at Kvam, which measured about 12.5 cm in diameter. Our new mammoth fragment therefore belongs to a full grown animal and probably originally measured some 2–2.5 m in length.

It is worth mentioning that both of the mammoth fragment finds were in the Gudbrandsdalen area where fourteen earlier finds have been made.

Some time ago, samples of two different mammoths – one from Fåvang, the other from Lillehammer – were sent to 'Laboratoriet for Radiologisk Datering' in Trondheim for age-determination by means of the  $C^{14}$  method. The results are quite remarkable.

The age of the tusk fragment from Fåvang (found in 1941) was determined by two different methods. Both gave fairly corresponding figures:  $22,370 \pm 980$  and  $20,000 \pm 250$  years before our time (1950). These ages compare well with those of two earlier determined samples, one of which was from Toten ( $19,000 \pm 900$ ), the other from Kvam ( $24,000 \pm 900$ ) (Heintz 1965, 1969).

Age-determination of the second sample, however – a fragment of left scapula from Søre Ål, Lillehammer (Heintz 1962) – has produced a surprising result. Again, two independent determinations were made. The first gave an age of  $46,000 \pm 2,000$ . S. Gulliksen, who was responsible for these investigations, said at the time that the figures ‘are close to the limit of the range of our apparatus, and another determination will be undertaken before the final report is forwarded’.

The age finally arrived at was close to that mentioned to begin with, i.e.  $45,400 \pm 1,500$ , and in a letter accompanying the report, Gulliksen repeated that age-determination had been difficult.

The age of the Lillehammer sample is therefore almost twice that of any of the other three samples. This surprising difference could be explained in one of three ways:

The age-determinations of the first three fragments could be wrong, and be in fact much older;

Age-determination of the Lillehammer fragment could be wrong, and instead be much younger;

It is possible that all the age-determinations are more or less correct, which would mean that mammoths lived in Norway at least in two periods during the last glaciation.

Since age-determinations of three of the samples have produced results that correspond fairly well, the figure of around 20,000 is probably correct. Furthermore, recent investigations into the Pleistocene deposits in Norway and Sweden show that a comparatively warm interstadial probably took place in Scandinavia at that time (Bergersen & Garnes 1971, 1972, Hillefors 1969).

On the other hand, with the exception of one, age-determinations of mammoth fragments from Siberia all showed ages of between 30,000 and 46,000 years before our time (1950) when determined in Trondheim. This means that mammoths lived during the warm Gottweig interstadial. It is therefore reasonable to assume that mammoths could also have lived in Norway during the same favourable period.

The only way we are going to solve this problem is to determine the ages of as many mammoth fragments as are available to us. Up to now only four of the sixteen mammoth fragments found in Norway have been age-determined.

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